

REMARKS

This Amendment is being filed in response to the final Office Action dated April 29, 2008. In view of these amendments and remarks this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Support for the amendments is found throughout the specification and claims as originally filed, including Figs. 1A and 1B and pages 7-9.

Claims 1 and 3-31 are pending this application. Claims 7-31 have been withdrawn pursuant to a restriction requirement. Claims 1 and 3-6 are rejected. Claims 1, 5, and 6 have been amended in this response. Claim 2 was previously canceled.

Interview Summary

Applicant greatly appreciates the courtesy of Examiner Chu in granting a telephone interview with the undersigned on July 28, 2008. During the interview the undersigned discussed proposed amendments. The Examiner explained that the claims had to structurally distinguish the claimed unit cells from the fuel cells and electrolysis cells of the prior art. The Examiner suggested specifying the current paths from the battery to the unit cells, but explained that further consideration of the proposal would be necessary upon the filing of a written response.

Claim Rejections Under 35 U.S.C. § 112

Claims 1 and 3-6 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because “the cathode of the fuel cell stack” and the “anode of the fuel cell stack” in lines 12 and 13 lack antecedent basis. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The claims have been amended to address the asserted informalities. Applicant submits that the claims, as amended fully comport with the requirements of 35 U.S.C. § 112.

Claim Rejections Under 35 U.S.C. § 103

Claims 1 and 3-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Levy et al. (US 4,839,247) in view of Ito et al. (US 6,926,982). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

Levy et al. and Ito et al., whether taken in combination, or taken alone, do not suggest the claimed fuel cell system, motor vehicle, and automobile. Levy et al. and Ito et al. do not suggest the fuel cell stack comprising a plurality of unit cells, each unit cell including a membrane electrode assembly to generate electricity, the membrane electrode assembly comprising a polymer electrolyte membrane and two electrodes on both sides of and adjacent to the polymer electrolyte membrane, a fuel cell stack anode electrically connected to one of the two electrodes, and a fuel cell stack cathode electrically connected to the other of the two electrodes, wherein each unit cell is immediately adjacent another unit cell; a battery electrically connected to the fuel cell stack in a parallel connection in which an anode of the battery is electrically connected to the anode of the fuel cell stack, and a cathode of the battery is electrically connected to the cathode of the fuel cell stack, the battery supplies current to the unit cells of the fuel cell stack through the parallel connection to allow the unit cells to electrolyze water therein; and a controller programmed to: determine whether or not the fuel cell stack is generating electricity, and supply current to the unit cells of the fuel cell stack from the battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and supply current from the unit cells through the parallel

connection to charge the battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6.

Specifically, Levy et al. and Ito et al. do not suggest each unit cell is immediately adjacent another unit cell and that current is supplied to the unit cells of the fuel cell stack from the battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and current is supplied from the unit cells through the parallel connection to charge the battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6.

The Levy et al. device is designed for use in outer space. Levy et al. teach that fuel cells 18 and electrolysis cells 20 are stacked alternately on each other in order to supply water to generated in the fuel cell 18 to the electrolysis cell 20 without using any pumps. Thus, Levy et al. do not teach that each unit cell of the fuel cell stack is immediately adjacent another unit cell. Ito et al. teach that the unit cells are divided into fuel cell portions and hydrolysis portions. In the present invention, however, the unit cell either generates electricity or hydrolyze water (though not at the same time) depending on the direction current is flowing. In the present invention, when current flows from the battery the unit cell hydrolyzes water. On the other hand, when the unit cell is generating electricity current flows from the unit cell to the battery to charge the battery. The fuel cell system of the present invention does not have alternately stacked hydrolysis and fuel cell units, as in Levy et al., and does not comprise separate hydrolysis portions and fuel cell portions, as in Ito et al.

Even if combined, Levy et al. and Ito et al. would not provide the claimed fuel cell system. Because, if combined Levy et al. and Ito et al. would not provide a fuel cell stack in which each unit cell is immediately adjacent another unit cell, and a fuel cell system in which

current is supplied to the unit cells of the fuel cell stack from the battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and current is supplied from the unit cells through the parallel connection to charge the battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6.

Though the Examiner opined that a substack of Levy et al. can function as a battery place of the battery cells, the asserted structure would not meet the present claim limitations. This could not happen in the claimed structure, as the battery supplies current to the fuel cell stack when generation of electricity by the fuel cell stack is terminated. The substacks of Levy et al. cannot store electricity and supply it to the fuel cell stacks when the fuel cell stacks of Levy et al. terminate generation of electricity. Further, there is no suggestion in the references that electrolysis cells and batteries are art-recognized equivalents. Electrolysis cells require a source of electrical current to electrolyze water. Electrolysis cells are not sources of electrical current. Batteries, on the other hand, are sources of current and the current from the battery can be used in an electrolysis cell to electrolyze water. Batteries, themselves, are not electrolysis cells. In order to rely on equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958). Clearly, the cited art does not recognize batteries and electrolysis cells as functional equivalents.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge readily

available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). There is no suggestion in Levy et al. and Ito et al. of modifying the fuel cell system of Levy et al. provide a fuel cell stack in which each unit cell is immediately adjacent another unit cell, and a fuel cell system in which current is supplied to the unit cells of the fuel cell stack from the battery through the parallel connection to allow the unit cells to electrolyze water therein, when generation of electricity by the fuel cell stack is terminated, and current is supplied from the unit cells through the parallel connection to charge the battery when the fuel cell stack generates electricity, as required by claims 1, 5, and 6, nor does common sense dictate such modifications. The Examiner has not provided any evidence that there would be any obvious benefit in making such modifications to Levy et al. *See KSR Int'l Co. v. Teleflex, Inc.*, 500 U.S. ____ (No. 04-1350, April 30, 2007) at 20.

The only teaching of the claimed fuel cell system is found in Applicant's disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must not be based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The dependent claims are allowable for at least the same reasons as claim 1 and further distinguish the claimed fuel cell system.

In view of the above amendments and remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

Application No.: 10/637,660

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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